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To: Milwaukee-area physicians and other health care professionals

From: Geoffrey R. Swain, MD, MPH
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Re: Mumps Outbreak: Updated MHD Guidance for Healthcare Professionals

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Executive Summary

- I. A very large outbreak of Mumps (epidemic viral parotitis) is currently ongoing in the Midwestern United States. Milwaukee has seen over 100 cases; many more will likely occur in the coming weeks and months.
- II. Mumps, while usually self-limited, can have very serious complications including miscarriage (25% in first trimester), orchitis (25% of post-pubertal males), meningitis (10%), pancreatitis (4%), testicular atrophy, and encephalitis.
- III. Mumps is highly contagious by respiratory droplet spread, and also by direct contact with saliva. People are contagious both before and after symptom onset.
- IV. Two doses of MMR vaccine provide immunity to mumps in about 90% of recipients. One dose provides mumps immunity in about 80%.
- V. Confirmed, probable, or suspect cases of mumps require special management, including strict respiratory isolation and immediate notification of your local health department (in Milwaukee County, report to SurvNet at 414-286-3624).
- VI. Susceptible contacts to confirmed or probable cases of mumps should be given an MMR as soon as possible, and isolated until getting the MMR. All contacts should monitor themselves for symptom development, and contact their health care professional and their local health department immediately upon symptom onset.
- VII. Healthcare Workers need to assure their immune status against mumps, use personal protective equipment, and monitor themselves for mumps-like symptoms.
- VIII. All primary care professionals should make sure they have adequate supplies of MMR vaccine, should *query every patient for MMR history*, and should *vaccinate all patients* who do not already have known immunity against mumps.

Mumps Outbreak Summary

There is a large Mumps epidemic currently occurring in the Midwestern United States. Iowa has reported over 1500 confirmed or probable mumps cases in the past 3 months, which is several times more than the typical yearly total for the entire nation. Minnesota, Illinois, Wisconsin and other surrounding states have all had rapidly increasing reports of cases over the last month, including over 100 in the Milwaukee area. More such cases will likely be reported over the coming weeks and months.

The City of Milwaukee Health Department (MHD) is responding to this outbreak by working closely with local health care professionals, school and university officials, and others in

- promoting measles-mumps-rubella (MMR) vaccination in general and especially in those in higher-risk environments and those with known contact to mumps,
- recommending isolation of susceptible contacts and individuals with mumps symptoms, and
- enhancing mumps surveillance to ensure that rapid response and containment measures are implemented where practical.

Wisconsin's cases so far range from 3 to 84 years of age. Most of the Midwestern states are reporting cases primarily in college aged individuals, with secondary peaks in the 10-17 and the 26-45 year old age groups. Cases as young as 1 year and as old as 96 years have been reported.

The MMR is substantially more effective in protecting against measles than it is against mumps. Two doses of MMR provide effective immunity to mumps in about 90% of recipients. A single dose of MMR is estimated to provide effective immunity in about 80% of people.

Most of the Iowa cases appear to be up-to-date on 2 MMR vaccines. Since the vast majority of Iowa college students have had 2 doses, there are relatively few 1-dose recipients or unvaccinated individuals available to become ill in those populations. Early CDC analyses of Iowa data indicate that the vaccine appears to be as effective as ever.

Mumps Disease Summary

Mumps is a potentially serious viral infection of the parotid or other salivary glands. In addition to inflamed, swollen and tender salivary glands, other signs and symptoms of mumps infection may include fever, fatigue, weakness, cough, or pain with chewing or swallowing. Up to 1/3 of mumps patients may be asymptomatic. Two doses of MMR are about 90% protective against mumps, and provide even higher protection against serious complications.

Symptoms of mumps typically appear 12 to 25 days after exposure, and there is no routine treatment available. Mumps spreads easily to non-immune persons; being within 3 feet of someone with mumps constitutes an exposure. The virus spreads mainly via aerosolized droplets, and occasionally from direct contact with saliva or via sharing utensils, cups, etc.

Communicability and Complications

Mumps patients are communicable from up to 7 days *before* symptom onset until up to 9 days after onset of parotitis or other salivary gland inflammation. *Up to one third of mumps patients are asymptomatic, but can still spread the disease to others.*

About 10% of cases develop mumps meningitis, often requiring hospitalization. Pancreatitis, usually mild, occurs in about 4% of cases. Mumps encephalitis is rare (about 1/10,000) but has a fatality rate of about 1% and can result in seizures or paralysis long-term. About 1/4 of pregnant women will spontaneously abort if they get mumps in their first trimester. About 1/4 of post-pubertal males with mumps will develop orchitis (usually unilateral), 1/3 of which result in testicular atrophy, although sterility is rare. Other complications can include oophoritis and deafness.

Susceptibility and Vaccination

In non-outbreak situations, either a single dose of mumps-containing vaccine or being born prior to 1957 is usually considered sufficient for immunity to mumps. In the context of an outbreak, a higher standard is indicated.

Below is a matrix that was developed to provide guidance and assistance in determining mumps immunity in select categories of individuals and as related to the current mumps outbreak in the City of Milwaukee. Checking a single box in any of the categories listed below is currently considered by the MHD as achieving mumps immunity in the context of outbreak case and contact management.

Please note that this guidance should only be used for outbreak case and contact management within the City of Milwaukee jurisdiction. Criteria for mumps immunity may vary in other jurisdictions and persons should refer to their respective local public health agency for specific information in this regard.

Determining Immunity to Mumps	2 mumps-containing Vaccinations (e.g., MMR)	Positive Mumps Titer	History of Medically Diagnosed Mumps	1 mumps-containing Vaccination (e.g., MMR) and Born Before 1957	1 mumps-containing Vaccination (e.g., MMR)
Healthcare Workers (including Long-term Care Facility employees)	<input type="checkbox"/> OK	<input type="checkbox"/> OK			
Employees and Students in Schools, Universities or Childcare Centers*	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK		
General Public (4 years of age and up)	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK	
Children (12 months to 47 months of age)*					<input type="checkbox"/> OK
Children (less than 12 mos. of age)	Not Necessary to Prove Immunity to Mumps				

*Children 1, 2, or 3 years old who have come into contact with either a probable or confirmed case of mumps should receive their second MMR vaccination, provided 28 days have elapsed since their first vaccination.

MMR should not be given to children under age 12 months, to pregnant women, or to severely-immunocompromised persons.

Rationale for stepwise susceptibility criteria in table above:

Healthcare Workers (HCW): HCWs are not only at greater risk than the general public of getting mumps, but they are also at greatest risk of transmitting mumps to high-risk persons (e.g., immune compromised).

Individuals Present in Schools, Universities, or Childcare Centers: These individuals are at greater risk than the general public of getting mumps, but not at as great a risk as HCWs of transmitting mumps to high-risk persons.

General Public: Note: in an outbreak setting, such as we currently face in Milwaukee, the MMR recommendations for the general public are greater than they would be in non-outbreak situations.

Most members of the general public are unlikely to have pre-exposure evidence of positive mumps titer or medical documentation of mumps disease. A person who is unsure of their prior vaccination status should be revaccinated; there is no increase in adverse reactions with receipt of

“extra” doses of MMR. Conversely, it is generally *not* recommended to knowingly give a 3rd dose of MMR, because 2 doses suffice.

The MMR is substantially more effective in protecting against measles than against mumps. Two doses of MMR provide effective immunity to mumps in about 90% of recipients. A single dose of MMR is estimated to provide effective immunity in about 80% of people. Since immunity is not 100%, *parotid or other salivary gland swelling should be considered probable mumps even in a previously-immune individual.*

Children under 12 months of age are too young to receive MMR, but mumps occurs only very rarely in this age group and is usually mild, so they are generally not considered susceptible. Children over 12 months of age who have received their first MMR dose are also generally not considered susceptible, and do not have to receive the second dose earlier than the usual 4-6 year visit. For children in a setting with high risk of mumps transmission (e.g., a day-care on a college campus experiencing a mumps outbreak), clinicians can consider giving the second dose earlier than usual. A minimum of 28 days is required between MMR doses 1 and 2.

Vaccine can take up to 14 days to produce immunity in a previously-unvaccinated individual, but immune response is much quicker in persons who have had either prior mumps disease or a prior dose of MMR vaccine. Therefore, in many cases, administration of MMR vaccine post-exposure is appropriate and may prevent or modify disease.

All primary care clinicians should make extra “reminder/recall” efforts to assure that every susceptible individual in their practices are offered MMR vaccination. Top priority for such reminder/recall efforts should be health care workers, students, and school & daycare workers.

Pregnancy

All pregnant women should be tested for mumps immunity by serology at the same time as their measles and rubella serologies are taken. Pregnant women may not receive MMR. Pregnant women who are not immune to mumps should be extremely careful to avoid mumps exposure, particularly during their first trimester.

Managing Mumps Cases

Any person experiencing any symptoms of parotid or other salivary gland inflammation, regardless of vaccine history, **MUST** remain at home in isolation and not attend work or school until 9 days after onset of salivary-gland-specific symptoms. They should immediately contact their primary healthcare professional and the MHD at 414-286-3624 to arrange for appropriate laboratory testing and contact investigation.

Initial laboratory testing for suspect or probable cases should include urine and buccal swab for viral culture and for PCR. Mumps IgM should be drawn only in persons with clear mumps-like symptoms. Mumps IgG is primarily helpful in persons with no prior mumps-vaccine history.

In Milwaukee County the specimens should be sent to the City of Milwaukee Health Department lab; elsewhere in Wisconsin specimens should be sent to the Wisconsin State Laboratory of Hygiene (for culture and PCR) or to a commercial lab (for serology). Please see www.milwaukee.gov/mumps for more information regarding lab specimen collection. *Do not send mumps culture or PCR specimens to out-of-state labs due to significant delays in shipping, processing, and results reporting.*

Managing Asymptomatic Mumps Contacts

Laboratory testing for mumps is not recommended for asymptomatic contacts. Conversely, any person who has had contact to a confirmed or probable mumps case who then develops symptoms should be tested and managed as a suspected or probable case (see case management above and case definitions below).

A) Immune Contacts

Persons who fit one of the immune categories above and who are contacts to known or suspect mumps should be advised to monitor their symptoms carefully. If *any* evidence of salivary gland inflammation develops, they should be managed as a probable case (see above).

B) Susceptible Contacts

Persons who do not *with certainty* fall into one of the categories defining immunity in the table above should be considered susceptible. Susceptible contacts should receive an MMR vaccination as soon as possible, and should isolate themselves at home until getting the MMR.

Note: If they choose not to get an MMR, they should be quarantined at home for a period of 25 days from last likely mumps exposure to observe for symptoms and to prevent further spread of mumps. Since mumps becomes contagious prior to symptom onset, it is especially important during this period for susceptible contacts to avoid coming in contact with persons at high risk of complications from mumps such as pregnant women or those with weakened immune systems.

Mumps Case Definitions

A) Clinically Compatible Syndrome

An illness with acute onset with either

1. unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting ≥ 2 days, and without other apparent cause, OR,
2. in a mumps outbreak, unilateral or bilateral swelling or tenderness of the testicle(s), lasting ≥ 2 days, and without other apparent cause such as epididymitis, torsion, etc.

B) Confirmed Case

A clinically compatible syndrome and either

1. a known epidemiologic contact link to a laboratory confirmed case, or
2. laboratory confirmation (see below)

C) Probable Case

A clinically compatible syndrome not meeting the confirmed criteria

D) Suspect Case

1. A person with a positive mumps IgM and no mumps-compatible symptoms, or
2. A person with non-specific viral symptoms and no salivary gland swelling who is known to have had contact with a confirmed or probable mumps case

E) Laboratory Confirmation

Any one or more of the following

1. Positive mumps IgM titer (can take up to 5 days after symptom onset to turn positive)
2. Positive mumps viral cultures from either urine or saliva
3. Positive mumps PCR
4. A 4-fold rise in mumps IgG titer between acute and convalescent serum specimens

Lab Notes: A positive IgG is evidence of immunity to mumps only if taken before known contact. A person with no pre-contact sero-status and a post-contact serology which is negative IgM but positive IgG might either be immune or in the early stage of developing infectious mumps. Convalescent sera should be drawn at least 2 weeks after the acute specimen. Convalescent IgG may be of little help if the acute IgG was positive.

Healthcare Worker (HCW) Vaccination and Infection Control

- [Mumps Immunity for HCW](#)
- [Personal Protective Equipment \(PPE\)](#)
- [Symptom Monitoring](#)
- [Future Updates](#)

Health Care Workers – Immunity

In the context of a mumps outbreak, Health Care Workers (HCWs) should demonstrate immunity to mumps in order to continue their work. This is particularly important for any HCW who may be evaluating mumps patients or contacts OR who has any contact with pregnant or potentially-pregnant women or immune-compromised patients.

The definition of immunity to mumps for HCWs is more stringent than for the general public. HCWs are considered immune to mumps if any of the following are true:

1. HCW has serologic evidence (“titer”) of immunity to mumps (not just to measles and rubella), OR
2. HCW has been vaccinated with at least two doses of mumps-containing vaccine (e.g., MMR) *and* has documentation of the exact dates of those vaccines (at least the specific month and year) - - *regardless of age*

Health Care Workers – Personal Protective Equipment (PPE)

All HCWs, regardless of their mumps immune status, should wear a surgical mask at any time they are evaluating unmasked patients with known or suspected mumps OR unmasked susceptible asymptomatic mumps contacts

All patients suspected of having mumps symptoms should wear a surgical mask at all times while in a health care facility. Susceptible patients who are contacts to known or suspect mumps cases but who have not developed any mumps-related symptoms are recommended to wear a surgical mask while in a health-care facility, but do not need to wear a mask in other venues once they have received a post-exposure MMR.

Unlike TB, mumps is spread by relatively large droplets, so “droplet precautions” (not “airborne precautions”) are appropriate for mumps. Therefore, negative pressure isolation and/or N-95 or other similar respirators are not necessary for protection against mumps; a surgical mask is sufficient.

Health Care Workers – Symptom Monitoring

Since neither non-laboratory-proven history mumps disease nor 2 doses of MMR provide immunity in 100% of persons, all HWC who have known exposure to mumps patients or to potentially incubating contacts of mumps patients should monitor themselves for the development of mumps-specific symptoms for a period of 25 days after last exposure. If any salivary gland swelling or tenderness develops at any time, the HCW should stay home, report the symptoms to their occupational health unit and their local health department, and get tested for mumps immediately.

Updates

Further updates to HCW Vaccination and Infection Control will be made available as relevant information or changes in information warrant. This information will also be posted on the MHD website at www.milwaukee.gov/mumps.